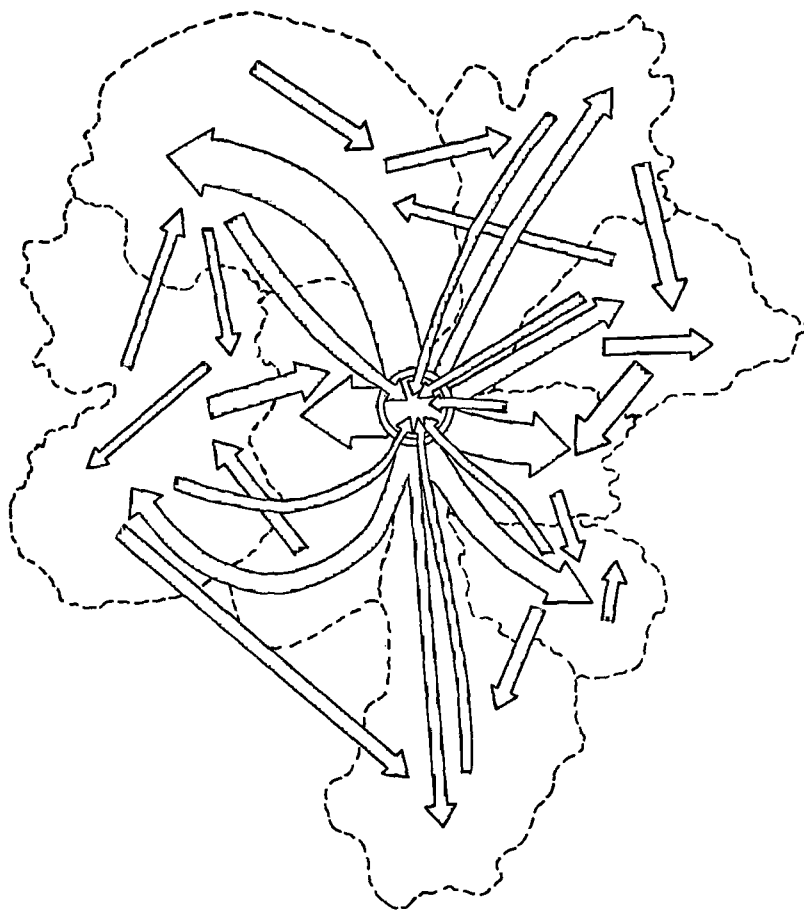


# GEOGRAPHIC PERSPECTIVES IN MIGRATION RESEARCH

*A Bibliographical Survey*



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and  
Ole Gade**

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# **GEOGRAPHIC PERSPECTIVES IN MIGRATION RESEARCH**

**A Bibliographical Survey**

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## PREFACE

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We would also like to thank Mr. Carl Flick and Miss Jeanna Campbell for their research assistance, and a special debt of gratitude is expressed to Mrs. Shirley Brown and Mrs. Carol Mundy for their pleasant attitude during the tedious task of typing the drafts of both the text and references.

Hopefully, this monograph will fill a void in migration research literature for geographers and others interested in the topic.

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## THE ORGANIZATION OF MIGRATION RESEARCH

The main objective of this volume is to review the contributions of the geographic discipline to the empirical analysis, methodology, and theory of human migration in the technologically advanced world. A wide range of books and other published materials, about 90 per cent appearing since 1964, have been assessed in preparing this volume. Nearly 40 per cent of these are cited.

Geographers have been traditionally concerned with the analysis of spatial process and organization; the structure, form, or arrangement of physical and cultural phenomena of the earth's surface; and the processes instrumental in bringing them about. The emphasis in human geography is increasingly on research and theory formulation relating to process laws which attempt to explain phenomena as they have evolved. Nevertheless, it is accepted that spatial processes are but spatial manifestations of temporal phenomena, many of which are also the concern of other social science disciplines (Harvey, 1967). Contemporary geographic research explores the linkages between basic theories of spatial form and function (e.g., structure of the urban system, and economic location) and derivative theories of temporal process (e.g., industrialization, urbanization, and rural depopulation) (Harvey, 1969, p. 129). The movement of humans in space is one of the more important linkages of spatial form and process now being intensively explored, and migration is here a leading component.

### Geography Fundamentals

To set the stage for a review of the geographic migration research focus, we will identify its position and component parts within a hierarchical structure of the science of geography. This particular view of geography emphasizes the dualistic nature of a science that pursues investigations into man's physical environment as well as his cultural environment. Since our concern here is exclusively with the social science-migration component, our model (Figure 1) omits non-social science aspects at the upper levels of the hierarchy of scientific inquiry, and it omits reference to non-migration aspects at the lower levels.

The second level of the hierarchy illustrates the dominant concern with spatial attributes of form, function, and process. Spatial process includes a focus on the movement of humans in

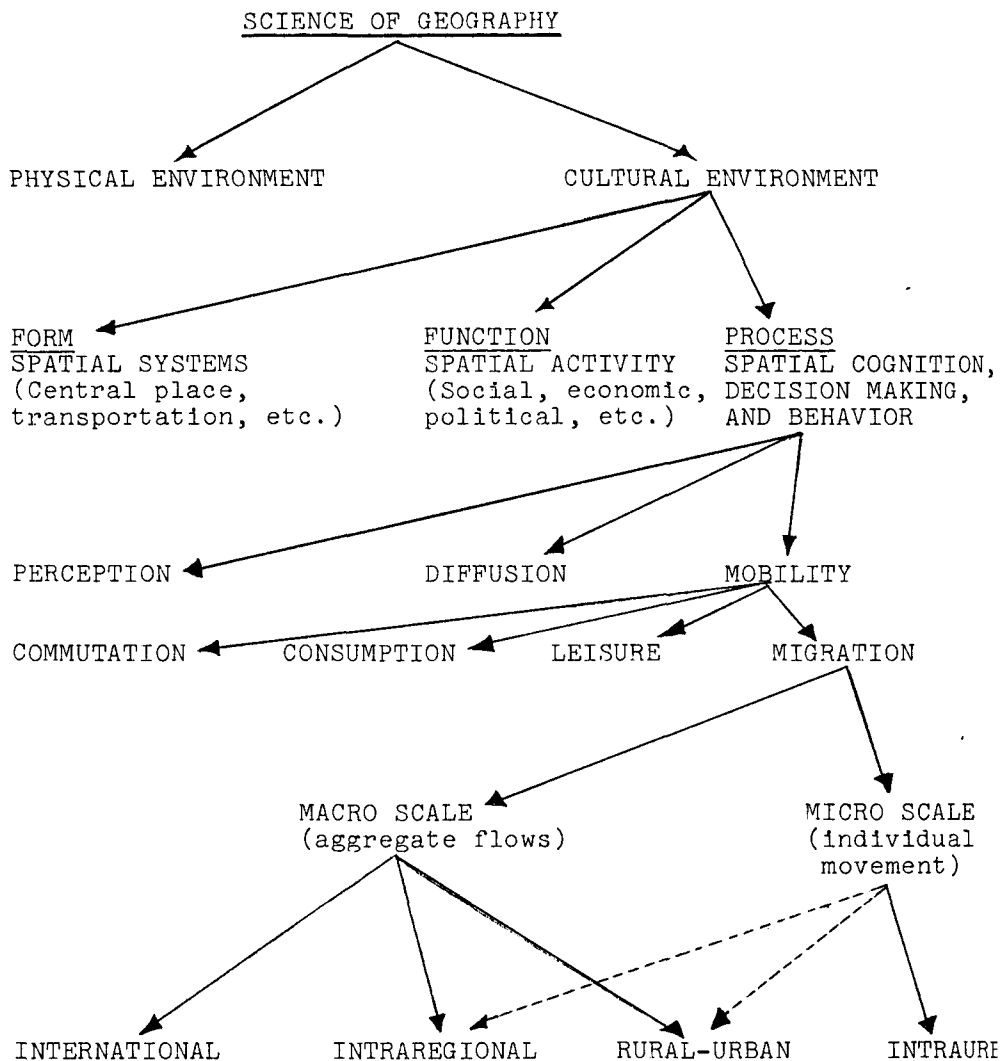


Figure 1. The migration research component of the science of geography. Arrows indicate direction of main research thrusts.

space, human spatial mobility. Migration is seen as but one component of spatial mobility; other components express the behavioral characteristics of getting to and from a place of work, of leisure activity, or a place offering goods and/or services. Migration research is compartmentalized into two scales of analysis. The micro-scale emphasizes individual movement, with most research utilizing the urban area as its empirical base. Macro-scale research analyzes aggregates of movement and tends to operate empirically on rural-urban, regional, national, and international levels. Within the past few years, there have been a few attempts at applying micro-scale approaches, behavioristic in nature, to rural-urban and interregional analysis.

New directions in research are pursued along horizontal lines within the scientific hierarchy. Examples of linkages actively being explored include migration and the formation of new spatial sub-systems (e.g., the ghetto).

In their introduction to People on the Move: Studies on Internal Migration, Kosinski and Prothero (1975b) identify and elaborate on four basic questions asked in migration research: (1) who migrates? (2) why? (3) what are the patterns and directions of movement? and (4) what are the consequences of migration? Geographers, with their well-developed interest in spatial differentiation and interaction, focus primarily on the third question but have uncovered and pursued spatial attributes of other questions as well. Clarification of geographic research in migration has been provided recently in a comprehensive manner by Norris (1972), de Castro Lopo (1975) and Courgeau (1976). Others have developed this more restrictively to the process of modernization (Zelinsky, 1971; Pryor, 1971; Gould and Prothero, 1975). Roseman (1971b) provides a thorough review of behavioristic considerations of migration as a well-defined component of all spatial mobility. From Willis (1974) has come an excellent comprehensive treatment of methodological approaches to migration research, while problems of measurement on the micro-scale are dealt with more specifically by Clark (1970) and Moore (1970).

### Classification of Migration Research

A number of attempts have been made in recent years to derive a classification system as an aid in ordering the complexities of research methodologies, empirical findings, and emerging theories in geographic migration research. Mabogunje (1970) employs a systems framework for the analysis of rural-urban migration. His approach is of general utility but is not further developed here due to an empirical focus on non-western societies. Gade (1971) uses a set theoretical framework, outlined initially by McGinnis, Myers, Pilger (1963) and Olsson



(1965a), for an assessment of about 200 recent research contributions, with an emphasis on interregional migration in western societies. Set theory provides an analytical framework within which migration may be defined as the permanent move of a group (or person) P from point in space A to point in space B. Denoting then migration between A and B, the basic relationship is:

$$M=f(A, B, P)$$

or in set theoretic terms where any migration study can be restricted to the set G:

$$G=\{A, B, P\}$$

By definition, G will generate a total of eight property spaces (since  $G=2^3$  or 8). Within each of these, some aspect of migration exists. Thus {A}, {B}, {P}, {A, B}, {A, P}, {B, P}, {A, B, P} and the empty set 0. This permits the following meaningful categories for the analysis of migration: (1) migrant characteristics; (2) place of departure; (3) place of arrival; (4) relationships between emigrant and immigrant areas; (5) migrants and emigration area; (6) migrants and the immigration area; and (7) interrelations of migration, migrants, and area.

This same theoretical framework has also been utilized by Swindell and Ford (1975) in distinguishing more clearly the contributions to the migration process of (1) places, (2) migrants, and (3) organization; the latter comprise factors facilitating or controlling the movement of people among places. Brown and Moore (1970) center their attention on the intraurban migration process and the role of individual decision-making in influencing spatial behavior patterns. A decidedly more narrow view of geographic migration research is discussed by Courgeau (1976). He views geographic research as involving two basic analytical frameworks: (1) spatial differentiation, which enables the geographer to see how migration affects the distribution of a population in a given area; and (2) spatial interaction, which permits the study of migration flows between areas.

As implied by these attempts at developing research typologies, geographic research on migrational aspects of human spatial mobility has developed in essentially two directions: interregional studies that emphasize aggregate flows and therefore involve normative and mostly deterministic methodologies, as well as economic location hypotheses; and intraurban studies that emphasize individual spatial behavior and therefore research strategies producing non-deterministic, behavioristic results. Such differences in research strategies have yielded markedly different sets of concepts and terminology with slight attempt, at present, toward bringing them together. The result, thus far, leaves a void in the development of an overall

perspective on migration research in geography. This study will begin by considering contributions to the two interest areas separately. However, as both derive from similar geographic analytical concerns (Figure 1), the differences appear to have evolved largely from variations in the unit of observation and in the scale of investigation.

## INTERREGIONAL MIGRATION STUDIES

Geographic research into the character and problems of interregional migration is confined largely to rural-urban movements. It centers not only on traditional concerns such as distance, direction, mass, chain migration, and migration fields, but increasingly is yielding new findings relating to the collective, as well as the individual, migration decision-making process. As a result, the research effort is dependent on the availability and character of information that defines or encourages a latent potential towards migration on the part of the individual, which, in turn, establishes a space preference within the migration-decision process. It is appropriate, therefore, to begin with an analysis of the studies focusing on distance as a dependent variable. We will consider the changing perception of distance on the part of the researcher, the methodologies devised to deal with this change, and some of the significant research findings.

### Distance

Many earlier studies of migration conceive the permanent relocation of people as a mass movement between given areas. These flows of people are then shown to vary positively with the perceived attractiveness of places and inversely with the distance between them. The influence of distance on migration has been effectively summarized by de Castro Lopo:

First, there may be a direct influence; for example through increasing cost of moving increasing distances, or through a preference in movers to move as short a distance as possible for various socially related reasons. Secondly, distance may have an indirect influence. Thus the information concerning possible destinations which is available to intending movers, is likely to decrease in amount and detail with increasing distance, with the result that the attraction of a place is less felt the further away the place is. The effect of intervening opportunities can also be considered as an indirect effect of distance since intervening opportunities must be considered a function of distance; thus more opportunities are likely to intervene between a point of origin and a potential point of destination, the further away that point is. Lastly, distance may in-

fluence migration incidentally, as it were, simply because any spatial pattern implicitly contains distance as a component (de Castro Lopo, 1976, p. 148).

The distance factor has been of special interest to geographers, who have used a variety of formulations for better describing its significance as a migration dependent variable. Most prominently used is the well-known "gravity" model, assiduously employed by a group of Swedish geographers in the 1950s (Dahl, 1957; Hagerstrand, 1957 and 1958; Hamnerberg, 1957, Kulldorf, 1955; Lougren, 1956 and 1957; Wendel, 1953 and 1957) and subsequently widely applied by geographers in the United States (Morrill, 1963; Olsson, 1965a; Wolpert, 1967). Typically, a Pareto function is used to describe the relationship of flow to distance,  $F=aD^{-b}$ , where F indicates flow, D indicates distance, and a and b are constants. As Hamnerberg (1957) notes, geographers are especially interested in the value for the constant b; low b values indicate a gentle distance gradient with a wide field of movement, whereas high b values give a sharp distance decay effect with a constrained field of movement. Fielding (1975), in his analysis of geography research on internal migration in Europe, discusses a recent Swedish study by A. Jakobsson that involves a search for differences in distance exponents as a function of urbanization, size of settlements, relative location and socio-economic and demographic structure. Fielding also mentions a study by Courceau in which the latter employed Pareto functions in an analysis of French departments. Courceau found that the exponent value (-2.00) stayed remarkably constant over the time interval studied, 1891-1962.

A number of findings appear to be increasingly supported by studies that use some type of gravity formulation with distance as the dependent variable. For example, movements occur more frequently over short than long distances (R. B. Adams, 1969a, and many others), mainly because of intervening opportunities and least effort (Olsson, 1965b). Distance moved varies with occupational group as well as with educational attainment (Dahl, 1957; Vernon, 1969; Keown, 1971; Fielding, 1975; Lycan, 1975; McKay and Whitelaw, 1977) and family income and wealth (Olsson, 1965b). In fact, the propensity to move increases the closer the migrant is to a place of greater economic opportunity (Norling, 1960). Lamont and Proudfoot (1975) find that distance travelled is in part a function of age, though the findings of Schnell (1969) do not support this. The Lamont and Proudfoot study is the only one in this group to use behavioristic data. Their sample of a migrant population in Alberta Province, Canada, was chosen randomly from the Municipal Electors Lists of 1970 and 1965. This is a sampling procedure in increasing use (Ward, 1975). None of these studies considers the extent to which distance decay rates obtained through the gravity approach will

be biased by the spatial setting in which the interaction is observed. This means that distance may influence migration incidentally because "any spatial pattern implicitly contains distance as a component" (de Castro Lopo, 1976, p. 148).

Geographers are among the many researchers who have used correlation regression analysis with distance as the dependent variable (e.g., Schwind, 1971 a and b; Lycan, 1975). In all cases a negative correlation coefficient is obtained, though the differences in the size of the coefficients raises some interesting questions concerning problems of scale (see table provided by Lycan, 1975, p. 216). These efforts have been challenged by Ewing (1974), who argues against the use of the gravity model type of regression analysis in determining the probability of movement from  $i$  to  $j$  as a function of their distance apart—unless the model is correctly specified. That is, distance is the only variable affecting movement. Riddell (1970), Willis (1975) and others have argued against the use of regression models on the ground that they too frequently fail to meet basic statistical inference assumptions.

Emphasis on the use of gravity models for examining the relevance of physical distance has gradually given way to other approaches that measure effective, or functional, distance. It became clear to many investigators that simple physical distance does not take into account variations in accessibility caused by differences in the transportation system or variations in distance perception that are influenced by cultural and psychological factors. Among the formulas that have appeared in the attempt to deal with such problems is the standardized intervening population approach pioneered by Olsson (1965b) in support of his thesis that migrants coming from different areas vary in their perception of physical distance. Using a gravity model formula, Olsson derived an exponent of -1.25 for migrants from North Sweden, a value he found comparable to those centering on -2.00 derived by other investigators for Central and South Sweden migrants. The conclusion is that migrants occupying the thinly populated North are faced with different accessibility constraints and thus evolve different distance perception. The Olsson approach is critically evaluated by Claeson (1968a), who subsequently applies a modified version in a study of rural migration in South Sweden (Claeson, 1968b).

More complex measures of functional distance have recently been introduced. Brown and Horton (1970) have shown that the concept of functional distance derives from the theoretical exercise of mapping the  $n$  properties of each locational entry in an  $n$  dimensional space. This allows the computation of a distance measure separating any two nodes such that it reflects the net effect of nodal properties upon their propensity to interact

(p. 76). Thus distance is not a function of physical separation between localities but rather an index of interaction, such as migration flows, among localities. Brown, Odland, and Colledge (1970) subsequently tested the viability of the functional distance concept on migration flow among the 100 largest SMSAs in the United States. They used a Markov chain method that employed the mean first passage time as an index of functional distance. This method of analysis, in addition to determining functional distance characteristics, establishes the hierarchical structure of metropolitan areas. It may be effectively applied to other types of spatial interaction as, for example, commutation, shopping behavior, leisure activities, information flows, and intercity trade movements. The prevalent use of indirect flows in Markov chain analyses delimiting functional regions is criticized by Stephenson (1974). Lycan (1969a) has applied scaling analysis to a matrix of migration flows among the nine United States census divisions. Some of his findings indicate that the distance variables used in traditional "distance decay" and "intervening opportunity" models may account satisfactorily for migration behavior in only part of the regional system.

Other geographers retain an interest in comparative studies of the "gravity" and "intervening opportunity" models. Haynes, Poston, and Schnirring (1973) suggest that the difficulty in deciding which of the two models better account for migration patterns lies in the high degree of correlation between distance and opportunity. They subscribe to an approach that relates distance to migration while controlling for intervening opportunity. Their results indicate that the intervening opportunity model offers a significantly different explanation of migration behavior at the aggregate level.

However, as noted by Johnston (1970, p. 387), though many studies have successfully fitted some form of the gravity model to an observed pattern of migration between pairs of urban centers, this model has frequently been criticized as an empirical reality with no theoretical rationale. Johnston argues that there are two main elements of migration theory embedded in the gravity model. One concerns the size of the place of destination and the other the distance between the urban pair. He hypothesizes that the individual's preferential movement pattern (his aspiration space) is related only to the size of alternative destinations, while the cost of overcoming distance is more important in directing the actual move. Johnston's findings, which derive from a comparison of interview data on latent migration with results obtained by use of the gravity model, highly support his hypotheses.

## Mass

Not all findings support distance as the prime influencing factor of interregional migration. In a study of migration between SMSAs, R. B. Adams (1969a) found that mass is the leading determinant, with distance, if exponentially calibrated, second in importance for migration rates between closely spaced centers. Metropolitan growth rate differentials, adjusted for migrant flow volumes, is a close third to distance as a determinant. The remaining determinants analyzed by Adams in this study—winter temperatures, income, unemployment, birth rates, and non-white population—are, in that order, of secondary predictive value. All of his results are essentially contradicted by the findings of Willis (1972). We suggest that the contradictory findings are more likely to result from differences in data structure and research methodology than from differences in research locale.

Under the assumption that cities attract migrants in proportion to their size, Hudson (1975) has investigated conditions under which population stability can be projected. Where the migration mass typically has been derived by use of a gravity-potential formula, Hudson devises a model from the theory of linear systems of ordinary differential equations. This approach might initiate the development of an adequate theory of the closed system of cities as petitioned for by Haran and Vining (1973). Whether or not this development will ensure that a deterministic formulation will no longer be used as a choice model of migration remains to be seen.

The continuing technological improvements in accessibility and communication are, on the one hand, decreasing the barrier effect of physical distance and, on the other, minimizing the attractiveness of urban centers as a function of their size. It is likely that social distance parameters, whether measured by differences in wealth, security, status or other criteria, are thereby becoming more conspicuous and therefore should assume greater significance in explanatory migration models.

## Migration Fields and the Urban Hierarchy

A concern with discovering the existence of a spatial orderliness to patterns of migrant origins led geographers some time ago to investigate the spatial phenomenon of the migration field defined as an area of outmigration (see, e.g., the early work of Hagerstrand, 1957). Brown, Odland, and Golledge (1970) have used a Markov chain procedure for delineating systemwide migration fields in the United States. Roseman (1971a), in a study of medium-sized Midwest SMSAs, showed the tendency of migration fields to peak in certain regions within the South, as

a result of channelized information flow from friends and family who have already migrated. Other studies have also emphasized information fields of potential migrants (Morrill and Pitts, 1967).

Schwind (1975) employs a field-theoretical approach to reduce the complexity of United States migration patterns to a small number of migration fields. Through the use of factorial and canonical analysis, he shows that those factors most strongly correlated with migration vary from region to region. Thus climate is tied to movement from the Northeast to Florida and the Southwest. Between and within other regions, migration direction appears influenced more by differences in socio-economic status and differences in labor-force characteristics. In other studies (see particularly Slater, 1976a-f), migration data is used to provide better understanding of functional regions and their hierarchical structure. Slater analyzed the United States Census Bureau matrix of 1965-70 migration flows among the 510 State Economic Areas. A hierarchical regionalization procedure was applied to the 510 x 510 matrix and well-defined functional migration regions were identified (Slater, 1976f).

#### Migration and Regional Development

Many geographers have been concerned with the study of factors influencing migration behavior on the interregional scale. For example, Rodgers (1970), Gade (1972), MacDonald (1972), Rathore (1972) and Williams (1975) have analyzed the roles played by differential regional economic opportunities and government investment priorities in Southern Italy, North Norway, France, Scotland, and Newfoundland, respectively. Both Gade and Rodgers rely on a range of multivariate techniques, including correlation-regression, residuals analysis, principal component, and factorial ecology. In all five cases, the central concern is with a region afflicted with persistent net outmigration. In North Norway, for example, long-term persistent outmigration has resulted in 35 per cent of its townships experiencing an annual population decline of 1.5 per cent, a sign of a critical depletion process (Hansen, 1975). McKay and Whitelaw (1977), similarly interested in differential regional economic development, investigated the role of organizations, both private and public, in generating migrant flows. Hayes and Bennett (1975) have studied governmental policy as a factor related to population growth and migration. Wheeler and Brunn (1968) have investigated black migration into rural Michigan as an alternative to an urban ghetto existence. A much neglected dimension, environmental conditions, also recently has been given an exhaustive review (Svart, 1974). Aside from the scant literature dealing with climatic variability as a factor in the migration



decision (Gibson, 1974), most studies focus on the problem of environmental stress. These are discussed later in this volume.

### Behavioral Approaches to Interregional Migration Analysis

It is indeed in applied migration analysis, i.e., that which is oriented toward planning applications, that geographers have particularly expanded their sphere of research interest in interregional migration. This has led not only to a consideration of a greater variety of factors influencing the migration decision but also to the use of behavioristic framework of analysis. Johnson, Salt, and Wood (1975), in an analysis of labor migration in England and Wales, found that conditions of housing, as well as income, occupational structure, family structure, stages in the family cycle, and family goals, were all factors relevant in explaining the migration of labor. Their data source comprised 550 migrant households. Staying within the behavioristic mode, others have investigated the migration decision process peculiar to the elderly, an increasingly mobile component of the total population in western societies. It is perhaps surprising that so few researchers have shown an interest in this phenomenon in the United States, considering the increasing concentration of retirees in certain parts of the country (however, see Golant, 1972a and b; 1975; 1977; Catau, 1973; Wiseman and Virden, 1977). In Europe, the nature and implications of retirement migration have been investigated for France by Cribier (1975) and for England and Wales by Law and Warnes (1973; 1975). With important implications for the United States, Cribier found that migration of the elderly tended to reinforce existing socio-economic/spatial segregation patterns, with the more desirable places attracting or retaining the wealthier portions of the retired population.

Where migration data are available by population register (as in most countries of Northern and Central Europe), through continuous government surveys (as in the United Kingdom), or in population residence registers (as in the Scandinavian countries) (Dunn and Swindell, 1972; Ward, 1975), the opportunities for behavioral research are obviously vastly enhanced. These and previously cited examples (Law and Warnes, 1973; 1975; Cribier, 1975; Johnson, Salt, and Wood, 1975) are all evidence of this, as is the attempt of Jones (1975) to find the structure of the migration process in an analysis of recent migrants to a small town in Wales. His interview data are biographical in nature and are designed to identify discrete stages in the mover-stayer framework. The results indicate that ethnicity (Welsh background), youthfulness, and previous migration experience are the more important contributing factors to the migration decision process. Acquired knowledge of the destination, housing quality and availability, employment opportunities, and environmental

conditions are less important

Demko (1974) and Ewing (1976) provide two of the very few North American research examples of a behavioral approach to interregional migration analysis. Demko's objective is to establish an urban cognition framework for prediction potential migration behavior. His sample is 141 residents of Southern Ontario and his procedure involves a factor analytic input to a multidimensional scaling algorithm. Ewing's paper is particularly important because of his attempt to provide a behavioristic formula for assessing aggregate data. Additional work in this area should, however, reflect a careful evaluation of Burnett's (1976b) and Cullen's (1976) critiques of contemporary individual behavior studies in geography.

### Historical Studies

A combination of government censuses and personal biographies has been used to document intraregional and interregional movements of populations in the 19th and early 20th centuries in Europe and the United States. Conzen (1974), Hudson (1976), and Meyer (1976) report on frontier migration as a factor in the settlement of Iowa, North Dakota, and southern Illinois, respectively. Ogden and Winchester (1975) examine the relationship between the location of residually segregated groups in Paris in the late 19th century and the location of the departments of origin within France. Pryce (1975) relates migration in Wales to changes in social structures and language areas.

### Problems of Scale and Boundaries

A serious methodological problem affecting interregional research derives from the conceptualization of migration as a movement across a political or statistical unit boundary. The problem normally results from a lack of relevant data on any but the aggregate level and is compounded when temporal changes in migrant behavior are considered, particularly if unit boundaries shift during the period of analysis.

Gade (1972) has used comparative factorial analysis in determining the degree of persistence of ongoing spatial processes, especially migration and urbanization. A significant degree of migration rate, distance, and direction persistency was discovered in spite of major areal boundary changes. The latter reduced the number of areal units in the study region by one-third over the 25-year study period. On the aggregate level, it is indeed important to define coherent structures in differing temporal and areal scale situations (Berry, 1971).

Our knowledge lacks specifics on exact locational attri-

butes of migration and therefore is weak in providing the basis for understanding the site and situation characteristics of migrant origin and destination (see Roseman, 1971b). This may help account for the recent research emphasis on intraurban migration that allows greater opportunity for individual behavior observation on an origin-destination basis. Certainly, the crossing of arbitrary boundaries (administrative boundaries, as defined by the United States Bureau of the Census) is an illogical migration threshold.

Results of investigations into migration process and migrant behavior are apt to differ with the scale of investigation where the essence of the inquiry is held constant across the different levels. "It is, however, also likely that these results differ due to the different objectives or approaches used by researchers at the different scales at which the movement process is viewed" (Chapin and Logan, 1969). As Lycan (1975) has noted: "(Geographic scale) acts as a spatial filter that presents a very different socio-economic sample of migrants depending on whether movements are tested between sets of many small regions or a few large ones" (p. 209). Johnson, Salt, and Wood (1975) suggest similarly artificial difficulties of interpretation have resulted from the use of an inappropriate scale of analysis.

In order to cope with some of the problems deriving from scale differences, Masser (1976) has devised a two-level spatial system accounting procedure. The procedure permits the identification of large discrepancies between local and interregional migrations trends. These reflect not only suburbanization processes but other factors influencing the more local migration patterns. The procedure, if adopted by central governments, is thought to have important planning implications.

Macro-micro conflicts are thought also to have resulted from the dichotomy between the 'economic competition' hypothesis (Moriarty, 1970; Logan, 1968; Getis, 1969). A lament on the lack of articulation between macro-level theories of spatial behavior and micro-level empirical findings has issued from Stea and Downs (1970) and Whitelaw (1971a). Whitelaw hopes for a modification of the deterministic slant of normative models. This is similarly the contention of Gale (1973, 1975a), who suggests, as do many others, that aggregate data, by their very structure, have influenced the emergence of highly restrictive conceptual frameworks and models. Employing these as support for planning recommendations for the array of public services increasingly demanded with continuing urban/regional change is indeed questionable. Gale's position has led him to develop a comprehensive set of principles, the application of which may yield that degree of validity in inference about migration needed in making urban and regional planning decisions more mean-

ingful. Others have provided other frameworks for nondeterministic projections of interregional migration. MacKinnon (1975) constructs a Markovian type of migration model that combines the three aspects of dynamics (i.e., time conditioned, probabilities, and a normative point of view); and Osayimwese (1974) employs a control theory framework for a rural-urban migration model. Both models are highly abstract and neither has been operationalized.

It is extraordinary that the relatively massive effort of geographic and other social science migration research substantially failed to forecast the recent migration turnaround in the technologically advanced world, particularly in the United States. Here a rather abrupt and unsuspected shift in the traditional south-north, rural-urban patterns of internal migration has occurred over the past ten to fifteen years (Berry and Dahmann, 1977; Zelinsky, 1978a; and compare with findings of Allen, (1977b)). One conclusion is that we need a systematic evaluation of migration models in terms of their ability to predict change in the patterns of migration volume and direction. But to accomplish this task effectively, we must first address those characteristics termed detrimental to the evolution of a sound methodological and theoretical structure in migration research. As identified by Mangalam (1968), Gade (1971), and Cullen (1976), these include: (1) failure to suggest the theoretical relevance of empirical findings, thus making it virtually impossible to use existing findings as analytical tools; (2) lack of consistency in the choice and/or character of explanatory variables, level of spatial aggregation, and time frame, thus creating often insurmountable problems for comparative assessment; (3) an approach to migration as an essentially random phenomenon, thus nonsupportive of theoretical constructs; (4) a view of the migration process as unique in time and space, as if findings of other studies have little, if any, relevance; (5) use of the migration differential approach (pioneered by Wolpert, 1965) without properly assessing the implications of the frequently appearing truncated view of individual behavior studies; and (6) use of behavioristic formulas merely as another approach to deriving generalizations about aggregate conditions, thus evolving micro-level theoretical constructs unusable in answering micro-level questions.

A combination of these methodological problems has given rise to the central weaknesses in interregional migration theory identified by Zelinsky:

We simply do not have anything that resembles a complete, coherent theory of human migration, even if we fall back upon the most relaxed definition of a social theory. Instead, we have a small kit of empirical generalizations which, among other failings, happens to be ethnocentric and time-bound.

These generalizations have given us interesting partial descriptions and perhaps pseudo-explanations of migrational events in certain places and periods, but they have not yielded the kinds of deeper explanation or reliable predictions that one must demand of a robust theory.

Whatever validity our ad hoc set of lawlike formulae may have had in the past, they seem quite impotent today in the face of two large phenomena that show every sign of inducing "paradigm shock:" the recent "turnaround" in the net flow of migrants between metropolitan and nonmetropolitan sections in several of our most socio-economically advanced nations; and the nature of the massive migrations now going on in the Less Developed Countries (Zelinsky, 1978b:1-2).

To these deficiencies in migration research, we may add the condition of a persistent lack of an applied research orientation. There have been gross inadequacies in responding to the migration research needs of public and private decision makers as well as to those of national, regional, and local planners.

Perhaps the difficulties recognized in the use of aggregated data is a factor contributing to the greater interest of geographers in intraurban studies, where micro-scale data and behavioristic modes prevail.

## INTRAURBAN MIGRATION STUDIES

In its initial stage of development, the methodology and focus of geographic intraurban research were quite similar to those employed in interregional studies. That is, the earlier work focused on normative studies that developed models and assessed aggregate data based largely upon the economic competition aspect of migration. The emphasis was placed on the impact of work place as a residential location factor. Data utilized were largely macro-scale in nature and thus afforded relatively slight insight into the behavior of individual migrants. For a brief review of the evolution of intraurban research methodology and focus, the reader may consult Whitelaw's (1971a) contribution on scale and urban migrant behavior, and the comprehensive reviews and critical commentary of Brown and Longbrake (1969); Brown and Moore (1970); Herbert (1973); Moore (1972); and Simmons (1968). The most detailed empirical studies have focused on residential search and mobility behavior in Toronto, Canada (Barrett, 1973 a and b; Simmons, 1974a).

In recent years, primarily since 1964, a growing number of studies have dealt with the behavioristic approach. These focus on (1) the decision-making process concerning reasons for moving and choosing a particular residential location; (2) directional, distance, and sectoral biases in intraurban migration; (3) patterns of search for and location of new residences; and (4) the development of models of intraurban migration. Although some of these studies, such as Boyce (1969) and Wolpert (1965), have been based on aggregate data, others, such as J. S. Adams (1969) and Brown and Holmes (1971a), have utilized personal interviews to obtain information related to the attitudes and the decision-making processes of the intraurban migrants. This approach has focused on micro-scale mobility emphasizing the impact of individual social forces on the migrant's choice of a new residence within the same urban area.

The beginnings of geographic research interest on the behavioristic, or micro-scale, level can readily be traced back to the contributions of the sociologist Rossi (1955) and the Swedish geographer Hagerstrand (1962). The primary interest in the Rossi study, Why Families Move, is related to the behavioral, or motivational, considerations of why people move. His basic framework is (1) an analysis of variations in both the socio-economic characteristics and the degree of social integration between more mobile and more stable areas; (2) an examination of

variations in both the socio-economic characteristics and the degree of social integration between more mobile and more stable areas; (2) an examination of differences in household characteristics and in attitudes regarding tendency to stay (or move) and complaints about the house or neighborhood between more mobile households and less mobile households; (3) an investigation of reasons why those who moved did so; and (4) an analysis of the decision-making process utilized by the movers in finding a new home. Rossi's categorical statements concerning the overriding importance of life-cycle changes in encouraging migration have been strongly criticized by Morgan (1973); however, Rossi is supported by Hagerstrand's findings viz, "The cycle of life almost inevitably gives rise to a distinct movement behavior" (1962, p. 65), and "If the question now is raised of how the individual occupies himself, while the line of life inexorably goes straight forward in time towards the point of death, the answer is—if we keep to the corresponding level of abstraction—that he indefatigably moves in the other physical dimension, in space" (1969, p. 63). Hagerstrand's data source is the Swedish population register, which permits observation of an individual's movement, not only from areal unit to areal unit but from house to house, during his entire life. His findings conflict with Morgan's critique, which is largely based on the presumed inapplicability of findings derived from areal unit analysis to individual behavior.

#### A Conceptual Framework

Much of the research in intraurban migration by geographers during the last eight to ten years has been related to many of the ideas advanced earlier by Hagerstrand and Rossi. Julian Wolpert is the geographer who seems to have been most instrumental in developing the foundations for a new conceptual framework for the geographic analysis of intraurban mobility. In his article, "Behavioral Aspects of the Decision to Migrate," (1965) he introduces a theoretical model in which he combines (1) the concepts of place utility; (2) the field theory approach to search behavior; and (3) the life-cycle approach to threshold information.

Wolpert views place utility as the "net composite of utilities which are derived from the individual's integration at some position in space." Essentially, persons are continually comparing—even if subconsciously—the utility of their present residence with all other places of which they are aware. Obviously, the basis of comparison is much more complete and objective in the town of habitation than in other settings. Furthermore, the perceived differential utility is a function of physical and human changes near the present location and of the changing aspirations and household relationships through time.

For Wolpert, the field that is used by the individual as a basis of comparison with his own residence is his action space. The action is "the set of utilities which the individual perceives and to which he responds." The parameters of the person's action space are largely determined by his needs, drives, and abilities. He may receive information about his action space not only from direct contact but from relatives, friends, the mass media, and other sources.

All persons are said to pass through a "life cycle," which changes according to functional alterations in an individual's life. Differences in the socio-economic characteristics and aspirations of people will most probably result in varying action spaces and information channels from which data are received. Since most persons want to minimize uncertainty, areas about which the individual feels most knowledgeable receive greatest consideration. Frequently, a person will delay any decision until he feels that sufficient data about the action space have been obtained.

Wolpert introduced a model that apparently has not been implemented. However, successful application of empirical findings to the concepts of action space and activity space has been reported by Horton and Reynolds (1971 a and b), although their study of Cedar Rapids focuses more upon travel and consumer behavior rather than migration behavior.

Another approach to the empirical delineation of the action space concept has emerged in a study done by Morrill and Pitts (1967) on the applicability of the mean information field (MIF) to migration behavior. Their contribution elaborates on an earlier work on the measurement and derivation of mean information fields by Marble and Nystuen (1962). Morrill and Pitts propose that for migration, as for trade areas and other mean spatial measurements, an aggregation of a sample of individual movements computed as a mean information field (MIF) can be used to predict the distance and general area of mobility for an entire population from which the sample is taken. Thus a sampling of individual fields of movement can be used as a predictive general measure of similar migrations for a total population.

Clark (1969) elaborates on the usefulness of MIFs in predicting residential migration. He wants to determine whether the action space, suggested by Wolpert to be the area in which a person searches for and finds a new residence, can be obtained by using MIFs. Clark converts the distance-decay functions of distances consumers travelled for three low-order goods and for three services into MIFs. The composite of these fields is identified as the economic activity space. He then uses a computer simulation model to designate residential moves from probabilities determined from the composite MIF. When comparing the



simulated moves to actual moves of a population, he finds a very high correlation coefficient. Thus he shows that MIFs of lower-order goods and services are similar to the action space of a person (or persons) and, consequently, can be used as a predictive measure of the area within which the intraurban mobility of an individual or population will occur.

J. S. Adams (1969) elaborates upon Wolpert's concept of action space by suggesting that urbanites fairly quickly develop a spatial perception of their city based upon their travel patterns. This mental map changes very little even though the individual resides in the same place for many years. Persons from various socio-economic sections of the city have different travel patterns and thus different mental maps of the urban area, but, whatever they are, they rarely change. He agrees with Wolpert that residents tend to move within restricted areas determined by their mental maps. Therefore, housing demand or supply in one section of the city will not directly relieve pressures or fill vacancies in other parts of the urban area. Poulson (1976) feels that people form "locational associations" with their home area and that these become "locational attachments" that can limit their mobility to their home corridor if desired housing is available. Donaldson (1973) states that his study provides "strong evidence supporting Adams' concept of 'sectoral bias in intraurban migration'" and "that similar spatial biases in their housing search patterns probably resulted from behavioral restraints imposed by their urban mental maps" (p. 33). However, Clark (1976b) states that "it would seem that the concern with perceptual mental maps of areas of the city as explanations of residential mobility and the particular concern with psychological motivations for residential location choice may be misdirected."

In 1966, Wolpert extended his ideas on the behavioral aspects of mobility in his article, "Migration as an Adjustment to Environmental Stress." He specifies that stress conditions, "noxious or potentially noxious environmental forces," upset the balance between the individual and his residential environment, and this leads to an attempt to bring into balance that relationship that he denotes as strain. Depending upon the degree and type of stress, a person might be able to make certain alterations in his present habitat so that harmony is restored. If this is not possible, migration may be the only feasible adjustment to stress. The threshold of stress necessary to result in migration will vary with the aspirations, life-cycle stage, and abilities (particularly financial) of the individual, and thus with his perception of the situation. In addition, the greater the stress-strain situation, the more hasty the decision; consequently, the less data input into the decision-making process, the greater the degree of bias involved. Wolpert concludes by presenting an ecological system model in an attempt to operation-

alize his ideas. Clark and Cadwallader (1973a) also set forth a conceptual model of locational stress and conclude that this concept can provide additional valuable understanding of residential movements.

The concepts of stress, place utility, and action space developed by Wolpert have been reviewed, elaborated, and modified by Brown and Moore (1970). They suggest that a change in the relationship between the needs of a household and its environment can produce stress and perhaps migration. If the individual decides to move, he must devise a set of criteria for use in selecting another residence, and then he must search for a suitable dwelling. The criteria used in defining the type of dwelling to seek depend upon the aspiration level of the person, which Brown and Moore define as (1) the relative importance of certain variables to the household, (2) the perception of the household in obtaining such a dwelling, and (3) the financial possibility of securing such a residence.

The likelihood of finding a vacancy to match the aspiration criteria is influenced by the spatial perception and knowledge of the city (and thus the vacancies) by the household. The information available to the searcher will be constricted further by the available information in the market place, the sources he uses, and how he uses them. Most of the knowledge he has about vacancies will be dependent upon his awareness space. This is similar to the action space and is the sum total of locations with which he is familiar. He obtains his information through direct contact during his daily travels in his activity space and through indirect contact from newspapers, realtors, etc.

The search space of the household is selected from its awareness space, and the search for a new residence is confined to this smaller area. The search time is crucial also, because, as it decreases, the pressures to enlarge the search space, intensify and expand the use of information sources, and redefine aspiration criteria increases. If time becomes greatly diminished, the possibility of making an unsatisfactory choice is heightened.

#### The Migration Decision-Making Process—A Systematic View

Lawrence A. Brown and his coworkers in 1967 embarked upon a major intraurban migration project whose main objective was to delineate and assess the spatial ramifications of the intraurban migration process. The major research findings through 1970 have been presented in papers by Brown and Holmes (1971 a and b) and Brown and Moore (1970). The systematic perspective of the decision to seek a new residence, followed by the decision either to relocate or to abandon the search, diagrammed in all of its

complexities, is presented in Brown and Moore (1970) (Figure 2).

The intraurban migration project produced progress reports that dealt in greater detail with individual component parts of the migration process. Additional work on place utility is documented in Brown and Longbrake (1970); Brown, Horton, and Wittick (1970); on the influence of the life cycle in Brown and Holmes (1971b); and on activity spaces in Johnston (1972).

A somewhat different view of intraurban migration is introduced by Roseman (1971c), who sees migration as either a partial displacement nature, where only some of the daily reciprocal journeys of the migrant will change, or of a total displacement character, where all of the daily reciprocal movements of the migrant are altered. The main type of partial displacement migration is certainly intraurban.

Depending upon the reason the household decides to move, it will select to remain in the same general area or to find another such area. If the household searches for another residence within the same general area, the possibility of finding a satisfactory site will be much greater than if the household moves to another area. This is a function of (1) the difference between the direct knowledge available concerning the home area and the indirect knowledge that will have to be used in most cases when moving to another area, and (2) the distance decay of information. Roseman contends, therefore, that a total displacement migration will probably result in one or more further partial displacement (intraurban) migrations, which will be necessary for the household to locate a more satisfactory place in the receiving community. Problems of social adjustment, and perhaps assimilation, in a new community will consequently stimulate a spatial adjustment. Partial displacement of intraurban migrants has been found by Lloyd (1977b) to occur in an ordinal sequence, changing lower-order points first and higher-order nodes last. These differences, however, do not depend upon significant variations in distance moved.

### Neighborhood and Migration

The increasing concern in the social sciences over existing differences in socio-economic conditions within American cities has led a number of geographers to contemplate the effect of variations in neighborhood characteristics on the migration decision.

Brown and Longbrake (1970), in their study of Cedar Rapids, Iowa, analyze intraurban movement characteristics for three types of neighborhoods: (1) middle life cycle, middle class; late life cycle, upper middle class; and (3) lower-economic

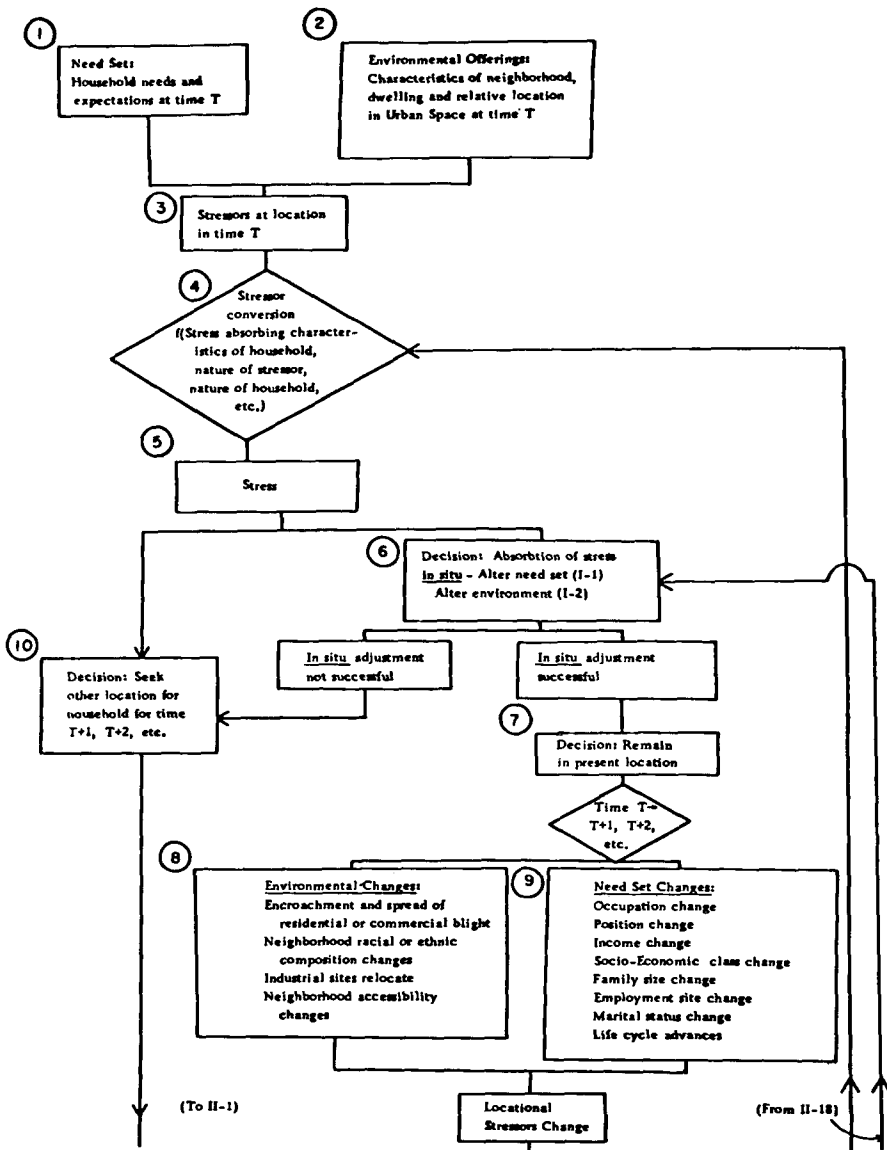


Figure 2. PHASE I: The decision to seek a new dwelling.



Source: Lawrence A. Brown and Eric G. Moore,  
"The Intra-Urban Migration Process:  
A Perspective," Geografiska Annaler,  
52 (B), pp. 110, 111.

status, unsound, rented, multifamily. They find that for all three neighborhood types, mobility is higher for neighborhoods with below average incomes and occupational levels, which are often associated with rental housing and households in the fairly early and late stages in the life cycle. High mobility also is often related to sections with poorer quality and multifamily housing units and with increasing encroachment by businesses and commercial interests. Moreover, they show that the most likely sections within these neighborhoods for immigrants are those where below average quality housing exists. This, they suggest, is the result of the greater outmigration—and thus vacancy—of these units and is indeed an improvement over the housing from which they moved. The authors also determine that the middle life cycle, middle-class neighborhoods are in greater demand, while the late life cycle, upper-middle class and lower-economic status, unsound, rented, multifamily neighborhoods are in lesser demand, in that order. However, all three of these are in greater demand than neighborhoods characterized by lower-economic status, sound rented two-family units, or downtown commercial enterprises. Some variables influencing this difference, such as available vacancies, tend to obscure the true rate of demand. Furthermore, each neighborhood exerts a similar degree of attractiveness for immigrants from all other neighborhoods within the city, although this holds more for the middle-class neighborhoods than for the others.

There also have been contradictory findings in the changing character of neighborhoods. Brown and Holmes (1971a) maintain that migration causes change in neighborhood characteristics, whereas Simmons (1968) comments that the social characteristics of neighborhoods remain rather stable. Thus people moving into an area are very similar to the ones leaving. This difference is particularly interesting in light of the findings of Brown and Longbrake (1970) that vacancies most often occur in housing of below average quality for that neighborhood.

Boyce (1969) and Bennett and Hayes (1975), in their studies of Seattle and Greensboro neighborhoods, lend added support to the Brown and Longbrake conclusion. Both find that most people moved from one residence in the city to another mainly as a result of dissatisfaction with their old house or neighborhood. This finding also supports Wolpert's (1965 and 1966) notions of place utility and stress. Furthermore, Boyce shows that job changes have no effect on intraurban residential change, but that alterations in family income and friends are significant influences on migration. His data also demonstrate that the overall level of mobility is much higher than generally believed and that there is no general pattern of movement from the central city to the suburbs. Lastly, he determines that there are no main sections of the city which act as senders or receivers of migrants from outside the city.

Applied geographers and planners appear to be primarily concerned with public or private policy implications of the migration process. Thus they show an increasing interest in investigating urban mobility as a function of housing conditions. An ability to move provides the opportunity to obtain "better" housing, or housing that is more appropriate for households at different stages of the life cycle. The filtering theory implies "upward" movement through the housing system. Watson (1974) has made some cross-national comparisons of the "multiplier" effect, i.e., the total number of moves caused by the initial creation of a housing vacancy. For the United States, the "multiplier" has been estimated at 3.5 by Lansing, Clifton, and Morgan (1969), a figure corroborated by White (1971); the "multiplier" in Great Britain is about 50 per cent less. This difference is apparently related to the much greater stress placed upon public housing in Great Britain. The implication for public policy is that the process of filtering (i.e., the tendency for housing to depreciate in value, eventually falling into the hands of lower-income families) will be expanded with a greater emphasis (i.e., public support) for new housing for middle- and high-income groups and a lesser emphasis upon public housing for the poor.

Moore (1971) compares two ecological models in explaining the variation in population turnover rates in a mononuclear city during a certain time period. He defines population turnover as the sum of moves out of all dwellings within a given area that are balanced exactly by moves into the dwellings in that area and the number of migrants into or out of the area (whichever is greater) divided by the average population of the area.

The two types of models developed by Moore are (1) distance decay models based on accessibility of the area to the center of the city, and (2) a regression model using various socio-economic, demographic, and housing variables. Four different measures of accessibility are suggested for use in the distance decay model. The curve of best fit is found to explain 58.4 per cent of the variation in turnover rates. When differences in traffic flows by sector are taken into account, this model explains 64.1 per cent of the variation.

In his second model, Moore relies upon assumptions taken from Rossi's work (1955). Of the five variables used in his regression model, four are related to Rossi's findings. Moore finds that this model explains 59.3 per cent of the variation in turnover rates and is not significantly greater than that found by the accessibility model at the .10 level. He also examines the relationships between population turnover and his five variables. Although he finds that simple correlations generally support his choice of variables, he discovers that they are characterized by a strong radial form when correlated with log

distance to center of the city. Furthermore, when he controls for accessibility to the center of the city, he finds that all his variables are at best weakly related to population turnover. He concludes by stating that the use of these variables in his regression model do not provide better descriptive power than the simple accessibility model, and that the utility of any of the correlations cannot be considered significant.

Moore's basic explanation of the failure of the regression model to improve substantially the explanatory effect of the accessibility model is that the quality of the data was poor, particularly at the scale of use. Whereas this might certainly be true, a significant part of the fault might also rest with the assumptions and findings that he borrowed from Rossi's work. In fact, many geographers, as well as sociologists and others, have used several of the assumptions and findings of Rossi (1955) as points of departure for their studies and in comparative analysis with their own results. In a recent article, Morgan (1973) delivers a critical analysis of several of Rossi's findings and of the acceptance of them by geographers and others. Morgan points out that conclusions reached in the Rossi book concerning the four specified mobility-status areas in Philadelphia have been overgeneralized by geographers to apply to all areas everywhere. He also points out that recent studies have produced contradictory results concerning the impact of household size on the desire to move, and he feels that evidence is lacking to prove that the life-cycle factor is the major stimulus to intra-urban mobility. In addition, he argues that cost restrictions for the young family may likely have as great, or greater, influence on mobility as household size. Thus inadequate housing is obtained from the beginning largely as a consequence of financial constraints. Finally, Morgan questions whether increase in family size is any greater, or as great, a stimulus for moving than the need for more space for growing children. We must agree with the conclusion of the critique that much further research and reexamination of the impress of the life-cycle factor on intra-urban mobility is needed.

### Spatial Bias in Intraurban Migration

One area of intraurban migration research cultivated almost exclusively by geographers focuses on the degree to which distance, direction, and urban sectors impose a bias on the migration decision-making process. The interest in spatial bias aspects of the migration process was initially pursued by Wolpert (1965) with emphasis upon directional bias. The concern has since broadened to include consideration of both directional and sectoral bias in both the search and the actual migration processes (see, for example, J. S. Adams (1969); Brown and Moore (1970); Moore (1970); and Brown and Holmes (1971 a and b). Following a



suggestion of Hagerstrand (1962), biases are generally measured by the use of standard ellipse techniques to illustrate the sequence of individual household residential movements within the urban area. The reader may refer to Figure 3 for the illustration of a range of hypothetical spatial biases.

J. S. Adams (1969) discovered in his Minneapolis study that over a period of several decades encompassing various numbers of moves within the city, there is both a directional and sectoral bias in migration, with orientation away from and through the Central Business District (CBD). Short moves dominate movements away from the center of the city, whereas longer moves are more important in migration toward the CBD. A subsequent study of Christchurch, New Zealand, strongly supports Adam's findings when his assumptions about the city's residential structure are relaxed (Donaldson, 1973).

The findings of Brown and Moore (1970) do not agree with those of Adams. They find little sectoral bias and only a slight directional bias toward the CBD. They also find that the new residence is located near the middle of the search space rather than along its boundaries, and that households located in the peripheral areas of cities exercise greater latitude in their search but are more directionally biased than those from near the city center. However, although the search space, when considered from the orientation of the new residence, shows little or no sectoral or directional bias, much greater biases are in evidence when it is observed from the previous residence.

Moore (1970) also investigated spatial bias by testing two models of urban information or contact fields. He states that it is tempting, though not necessarily correct, to attribute spatial bias of one phenomenon, such as information or migration fields, to another property that has a similar areal pattern. Moore shows that the standard procedure of fitting a distance-decay function to an individual's information field is not an appropriate measure of spatial bias, particularly if a person is situated away from the CBD. Indeed, the establishment of an individual's, and certainly a population's, contact field involves a much more complex spatial network than previously imagined.

Although his results are not conclusive, Clark (1971a) reports that areas nearer the central city have random patterns of movement, while in the more peripheral regions, migration is more sectorally biased. He states that such differences might be a function of the location of available housing. Whitelaw and Robinson's (1972) results, although inconclusive, also demonstrate a lack of directional-sectoral bias for moves of lower socio-economic families living near the CBD; for middle-and higher-status families in outlying areas, sectoral movements appear related especially to the commuter axis. Gilmour and

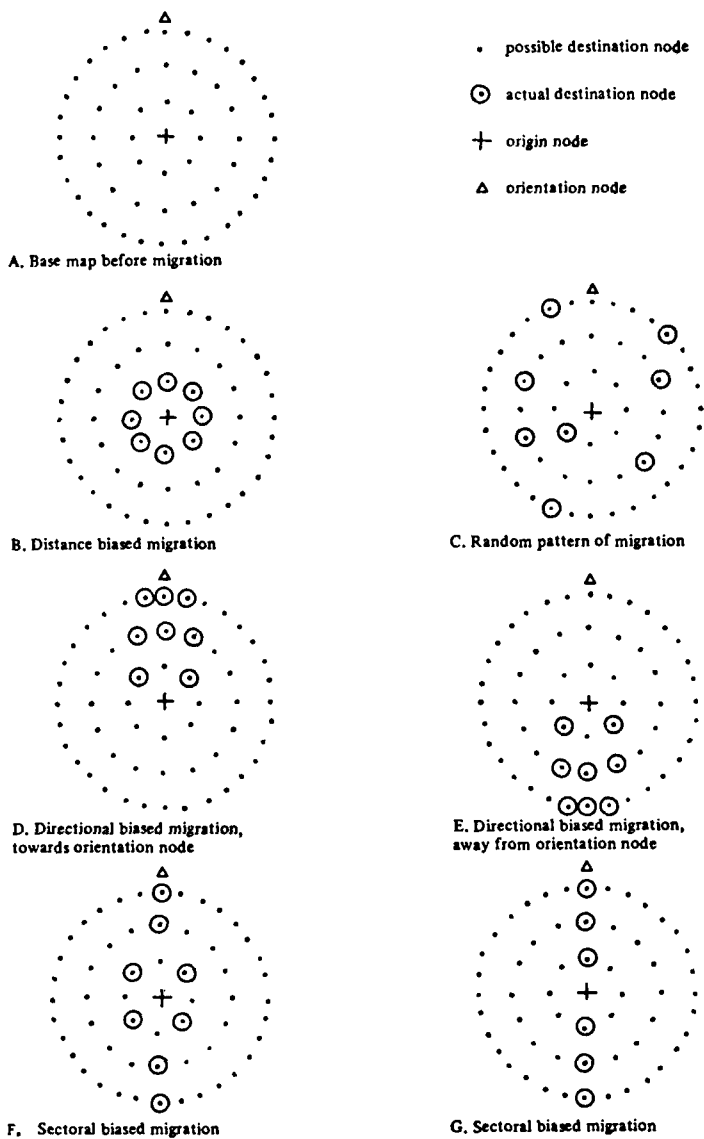


Figure 3. Spatial biases in migration.

Source: Lawrence A. Brown and John Holmes, "Search Behavior in an Intra-Urban Migration Context," Environment and Planning A, 3:p. 311.

Greer-Wooten (1972) relate distance to directional bias. Using broad socio-economic status areas within a city, they find that short-distance moves are more likely to be random, and that the longer the move, the greater the directional bias (see also the contribution of Willis, 1972).

It is necessary to test these ideas further. J. S. Adams (1969), for instance, finds patterns relating to only one urban growth model, the concentric zone theory. He uses as a basis for his study a large metropolitan area, which may have considerably different effects than a medium-sized town on an individual's perception of the total area, his awareness space, and, thus, his spatial migration biases. Moreover, Adams uses a less sophisticated measure of these biases than do Brown and Holmes. The latter authors suggest that differences in findings are most likely related to variations in the spatial form of the cities studied and to the resulting differences in total household activity patterns, household daily movement preferences, and the character of the vacancy market.

It could be that geographers have lost some sense of objectivity in striving to label certain spatial variables (e.g., spatial and directional bias) as major determinants in the migration decision. This is the conclusion of Poulsen (1973). He finds the following problems with the work of J. S. Adams: (1) regular activity space and the recurring travel behavior of individuals are not uniformly radial, so that mental images deriving from them are not likely to support the sectoral bias hypothesis; (2) the sectoral wedge is unrealistic when used as a representation of movement patterns due to downtown distance differences among migrants (Poulsen proposes an 'image corridor' as the more viable alternative construct, which he further develops in a subsequent study of Hamilton, New Zealand; 1976; 1977); and (3) substantial evidence is yet to be found in support of having an individual's regular activity space provide the sole source of information for his mental map. Poulsen further criticizes J. S. Adams for faulty use of directional data and analysis, and he criticizes Brown and Holmes (1971 a and b) for aspects of their research design as well as for their inappropriate use of standard ellipse techniques.

### The Interface of Migration Research and Urban Spatial Analysis

Before 1965, most migration research focused upon long-distance movements and the significance of moving closer to the place of work of the household head. As indicated above, much of the work since that date has dealt with short-distance moves and the importance of maximizing the aesthetic-status values (place utility) of the residence. Nevertheless, several recent articles have once again emphasized what is reported to be the

continued influence of place of work on place of residence.

Yapa, Polese, and Wolpert (1971) combine this notion and the place utility concept into the idea of the joint utility surface. They suggest the use of conditional probability statements in the intraurban setting as a means of arriving at the optional trade-off among maximum productivity (economies of scale), desirable living conditions (residential environments), and the journey to work (total costs of commuting). Holmes (1971 a and b) and Yapa, Polese, and Wolpert (1969) find that there are close parallels between commuting flows and migration patterns, and that migration shortens commuting journeys (see also Getis, 1969; and Logan, 1968). Although these studies are based on interurban and rural-to-urban movements, similar research efforts could be useful, especially within the larger metropolitan centers.

Another aspect of intraurban migration investigated by geographers during the last several years has been the pattern and impact of disadvantaged and minority groups within urban areas (see especially Rose, 1969). Davies and Fowler (1972a) and Fowler, et al (1972b) report that disadvantaged white migrants who have moved to Indianapolis from Appalachia and other parts of the rural South depend primarily upon relatives and friends already in the city for assistance in finding a place to live. The reliance upon the awareness space of the relatives and friends biases the newcomers search space to such a degree that an expanded neighborhood of residents from similar origin areas evolves. Fowler and Davies report that other disadvantaged white migrants in Indianapolis, however, are not so highly concentrated within neighborhoods. Bird (1976) and Wiseman and Virden (1977) have investigated the mobility patterns of public housing residents in London and the elderly in the United States, respectively.

Studies by Morrill (1965b), Lewis (1965), Clark (1972b), Rosenberg (1974), and Rose (1972) demonstrate that Blacks and Spanish-Americans (except for Cubans) are highly concentrated in one or more sections, or ghettos, within urban areas. Moreover, these minority group neighborhoods tend to expand along their peripheries rather than leap-frogging over white neighborhoods. Rose (1972) feels that there is little possibility of stopping the development of super-ghettos. He and others suggest that such a spread of minority-group residential areas results from white flight from the invasion of these groups. However, Greenberg and Boswell (1972) argue that this outmovement is really away from selected minority group-socio-economic classes associated with perceived neighborhood deterioration, and not from all minority peoples. Although minority groups generally are concentrated in certain sections of a city, different minorities are not always focused within the same neighborhoods

(consult also Deskins, 1972; Elgie, 1970; Hyland, 1970; Gilmour and Greer-Wooten, 1973; and Hyland and Peet, 1973). Other factors influencing the spread of minority ghettos include urban industrial decentralization (Hecht, 1973) and quality-of-life differences between the central city and the suburbs (Schnell, 1967; Roseman, 1976a; and White, 1974b).

## NEW DIRECTIONS IN MIGRATION RESEARCH

Before moving on to entirely new aspects of migration research, perhaps geographers should reexamine (Morgan, 1973) and replicate (Moore, 1969a) some of the basic assumptions, generalizations, and findings that have been reached during the last eight to ten years. Morgan (1973), Clark (1976b), and Poulsen (1973) have already raised serious questions and made substantial critiques concerning much of the previously accepted theory and findings in intraurban migration research. Much careful replication of these studies is needed to resolve the conflicts. Further testing of methods and results has often been suggested. The scale of movement—assumptions and findings in particular—also should be reviewed (Whitelaw, 1971a).

Many concepts and theories developed recently should be expanded. The need for further work on perception and decision-making in migration has been suggested by several researchers (Golledge, Brown, and Williamson, 1972; and Roseman, 1971c). Additional research is also needed on (a) environmental conditions and behavioral responses at the household level (Brown and Moore, 1970); (b) variations in search behavior of different household types resulting from varying assumptions about city size and the spatial form of the city (Brown and Holmes, 1971a); (c) the influence of previous moves upon any given set of moves in time and space; (d) examination of alternative behavioral models (Moore, 1969a); (e) the importance of various types of stress on mobility (Clark and Cadwallader, 1973a); (f) the importance of various household activities on the establishment of place utilities (Roseman, 1971c); (g) gaming simulation for the evaluation of preferences in a controlled environment (Moore, 1969a); and (h) constraints upon individual choice behavior.

One of the main aspects of the decision-making process is the method by which information concerning available vacancies reaches the household. Several authors have noted the importance of further research into (a) factors influencing the flow of information to urban households and the way this information is used in the household relocation decision (Clark, 1969); (b) dual models for action spaces of central city and suburban residents (Horton and Reynolds, 1971a); (c) analysis of contact fields as an approach to better understanding residential mobility (Clark, 1971a); (d) the incorporation of information fields into models of movement (Morrill and Pitts, 1967); and (e) the testing of complex contact-field models for different socio-economic groups (Moore, 1970).

Additional investigations of the nature and extent of directional and sectoral bias are also necessary. Future tests could use city regions of varying sizes and arrangements and use different distances moved (Clark, 1971a). Further refinements in the use of directional and standard ellipse analysis should yield more reliable results (Poulsen, 1973).

The relationship between commuting and migration should be examined further (Yapa, Polese, and Wolpert, 1969; 1971; Holmes, 1971, 1972), as should the impact of new immigrants to the city (Davies and Fowler, 1972a; Elgie, 1970; Hyland, 1970) and of minority group movements (Fowler and Davies, 1972 a and b; Rose, 1972; Lewis, 1965; Morrill, 1965b; Clark, 1972b; Deskins, 1972; Hyland and Peet, 1973).

Future research efforts also should deal with (a) the impact of urban spatial structure on migration (Getis, 1969; Clark, 1971a; Horton and Reynolds, 1971b; Pryor, 1971); (b) how status affects migration and how different status groups react to the process of moving (Whitelaw, 1971b); (c) the development of better methodology for measuring social distance moved in intraurban migration (Gilmour and Greer-Wooten, 1972); (d) the impact of migration upon settlement patterns (Roseman, 1971a); and (e) the impact of new housing on the mobility pattern within the city (Moore, 1971).

An effort has been made recently to apply many of the theories and concepts that have been developed basically for intraurban migration to other types of migration, such as inter-regional (Johnson, Salt and Wood, 1975; Law and Warnes, 1973, 1975; Denko, 1974; Ewing, 1976). Much of the work by Brown and Moore would be applicable. Further work along these lines is desirable.

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